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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/057,864	01/28/2002	James B.Y. Tsui	AFD 443	2940
26902	7590	06/02/2005	EXAMINER	
DEPARTMENT OF THE AIR FORCE			AGHDAM, FRESHTEH N	
AFMC LO/JAZ			ART UNIT	
2240 B ST., RM. 100			PAPER NUMBER	
WRIGHT-PATTERSON AFB, OH 45433-7109			2631	

DATE MAILED: 06/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/057,864

Applicant(s)

TSUI ET AL.

Examiner

Freshteh N. Aghdam

Art Unit

2631

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 28 January 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☒ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Claim Objections***

Claims 1 and 2 are objected to because of the following informalities:

As to claim 1, "The" should change to "A" to overcome lack of antecedent basis in the claim at page 10, line 1.

As to claim 2, "the" should change to "a" to overcome lack of antecedent basis in the claim at page 10, line 2.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jandrell (US 2003/0128158), and further in view of Min et al (US 2003/0021237).

As to claims 1, 5, 9, 10, 14, and 17, Jandrell teaches a method and apparatus in GPS ranging receivers comprising receiving a radio frequency (i.e. RF) signal, converting the RF analog signal to a digital signal (i.e. the first sequence) at analog to digital converter (Fig. 2a, means 206); squaring the signal samples (i.e. generating the second sequence; Fig. 4, step 404) wherein the squaring step doubles the signal

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frequency and comprises a constant term as it is well known in the art; removing the dc component of the squared signal (step 404; Pg. 8, Par. 95); averaging by reducing the number of samples of the digital signal using a decimation filter to form lowered frequency representations of the signal sequence; combining the lowered frequency signal sequence to form a composite lowered frequency representation of the biphase code modulated input signal (Fig. 4, step 405; Pg. 8, Par. 102); identifying the included frequency components of the biphase code modulated input signal by performing Fourier Transformation on the composite lowered frequency representation of the frequency down converted signals (step 409) see (Pg. 8, Par. 95-98, 102, and 104). Jandrell is silent about mixing a local oscillator signal with the dc component removed from the squared digital signal to form a frequency down converted sequence of real and imaginary signal complex value pairs. Min et al teaches mixing the digital signal with the respective cosine/sine values to obtain the frequency down converted sequence of real and imaginary signal complex value pairs wherein it is well known in the art to use local oscillators to obtain baseband signals and inputting the real and imaginary value pairs to the decimation filter and then to a Fast Fourier Transformation processor (Fig. 4, means 440 and 250, sequences 430a and 430b) see (Pg. 8, Par. 127, 129, and 130). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Min et al with Jandrell in order to provide the receiver with the capability to analyze particular portions of the spectrum associated with the spectrum of the input signal (Pg. 8, Par. 128).

As to claims 2 and 11, Jandrell teaches the radio frequency input signal comprises a course acquisition L1 code of a global position system signal (Fig. 2b, means 254).

As to claims 3 and 12, Jandrell teaches downconverting the RF signal to IF (I.e, intermediate Frequency) signal (Fig. 2b, means 258) wherein the RF signal is filtered (Fig. 2b, means 254) prior to the downconverting step to a specific frequency (i.e. 1575 MHz) prior to analog to digital signal conversion to form the first sequence at the rate of at least 2 MHz. One of ordinary skill in the art would clearly recognize that it is a design choice to specify the frequency of the course acquisition L1 code to an amount that suits the communication device.

As to claims 4 and 13, Jandrell and Min et al teach all the subject matters as recited in claim 3, except for the ADC converter to sample the 21.25 MHz signal at a rate of 5MHz comprises a one hundred twenty five times over sampling with respect to a Nyquist sampling requirement. One of ordinary skill in the art would clearly recognize that it is a design choice to over sample a signal at a specific frequency with respect to the Nyquist sampling requirement, in which it suits the communication system (Pg. 6, Par. 65).

As to claim 6, Jandrell teaches performing the recited steps in the off line operation mode see (Fig. 2b, means 264). One of ordinary skill in the art would be motivated to perform the recited steps in the real time mode as there are numerous references teaching GPS receivers operating in the real time mode in order to speed up the system processing time.

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As to claim 7, Jandrell teaches removing the DC component from the squared digital signal by applying the " $N^2-N$ " formula which means subtracting an average value signal from the squared signal (Pg. 8, Par. 98).

As to claim 8, Jandrell discloses that the RF input signal includes a Doppler shift component of frequency less than 10 KHz see (Pg. 8, Par. 102).

As to claim 15, Jandrell and Min et al teach all the subject matters claimed above except for the local oscillator and heterodyne mixer means are characterized by an input frequency of two and half MHz and a Doppler output frequency of ten KHz. Jandrell teaches that the Doppler frequency shift is typically less than 10 KHz, which is well known in the art. One of ordinary skill in the art would clearly recognize that when the signal is squared in the time domain the frequency is doubled in frequency domain; therefore, if the frequency prior to the squaring step were 5 MHz then after the squaring step it would be 2.5 MHz.

As to claim 16, Min et al teaches mixing the digital signal with the respective cosine/sine values to obtain the frequency down converted sequence of real and imaginary signal complex value pairs wherein it is well known in the art to use local oscillators to obtain baseband signals and inputting the real and imaginary value pairs to the decimation filter and then to a Fast Fourier Transformation processor (Fig. 4, means 440 and 250, sequences 430a and 430b) see (Pg. 8, Par. 127, 129, and 130). One of ordinary skill in the art would clearly recognize that the real and imaginary value pairs are of equal sequence lengths. Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching Min et al with Jandrell in order to provide

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the receiver with the capability to analyze particular portions of the spectrum associated with the spectrum of the input signal (Pg. 8, Par. 128).

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Jandrell (US 2003/0016169), Abaunza (US 5,271,034), and Hurd (US 4,578,678).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Freshteh N. Aghdam whose telephone number is (571) 272-6037. The examiner can normally be reached on Monday through Friday 9:00-5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

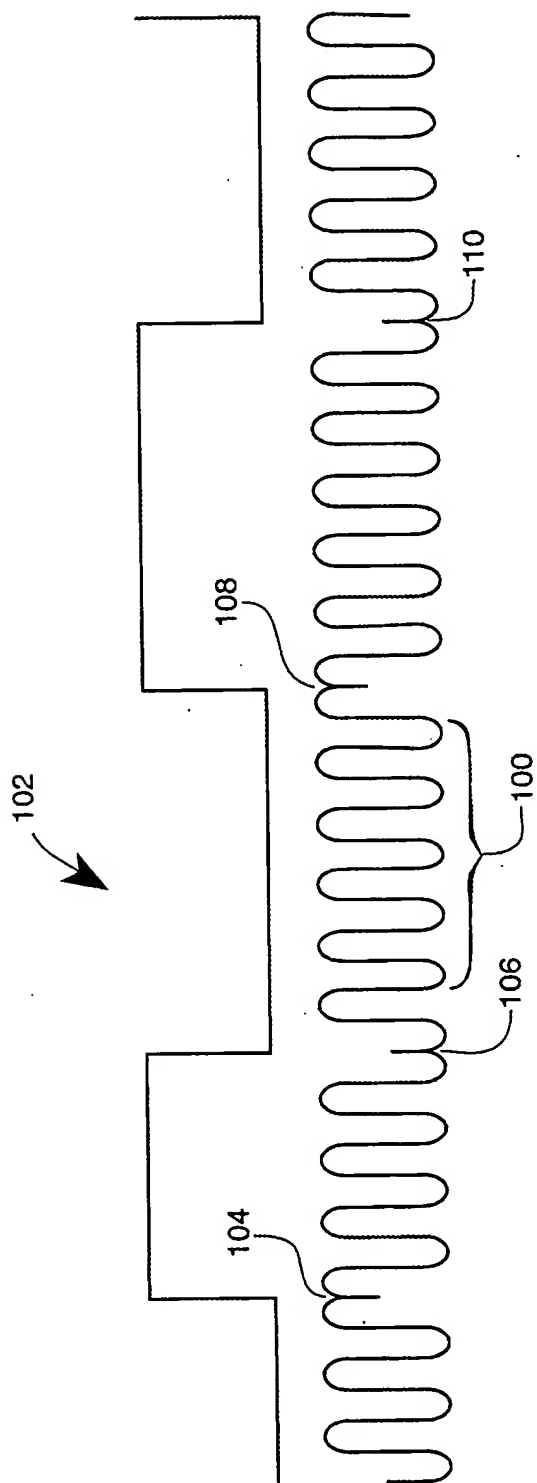
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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Freshteh Aghdam  
May 23, 2005

  
**MOHAMMED GHAYOUR**  
**SUPERVISORY PATENT EXAMINER**





**Fig. 1**

202210149845001

200210143825001

BW, PL 5,999,889

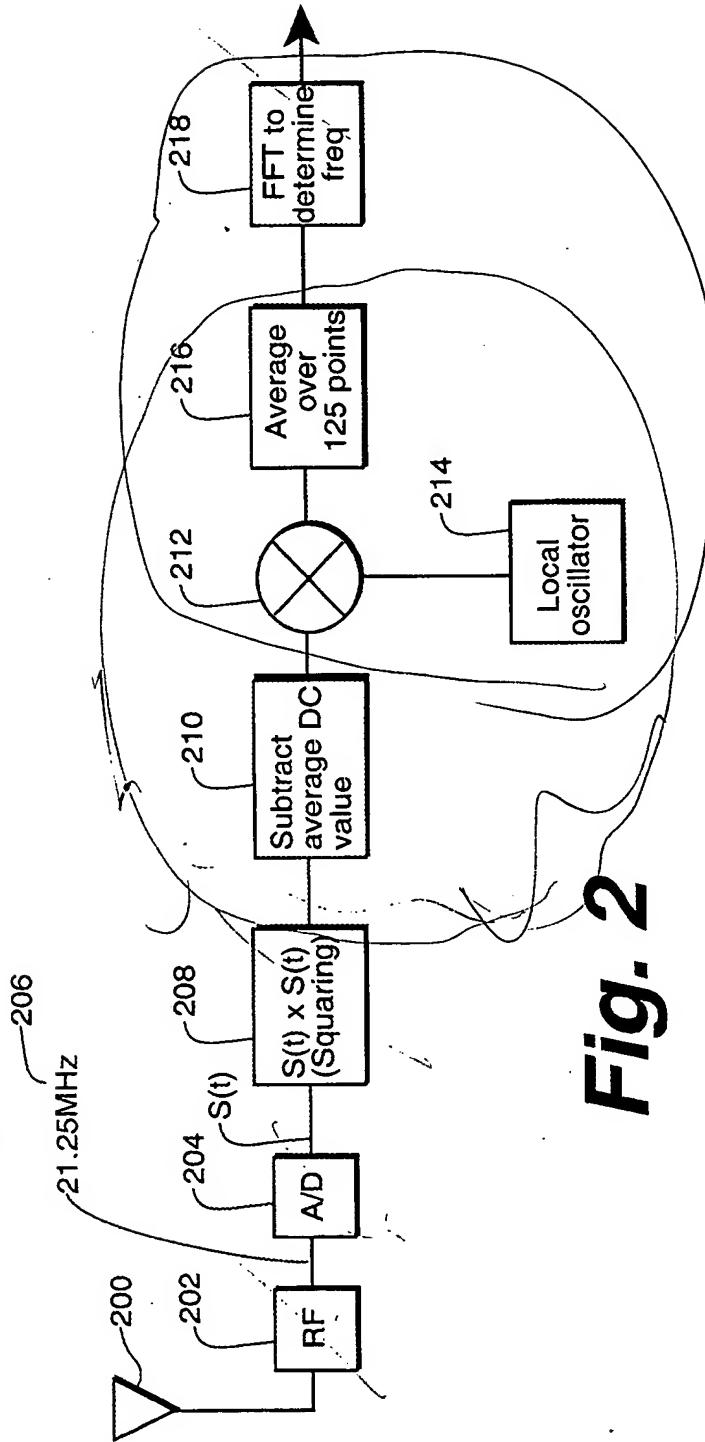
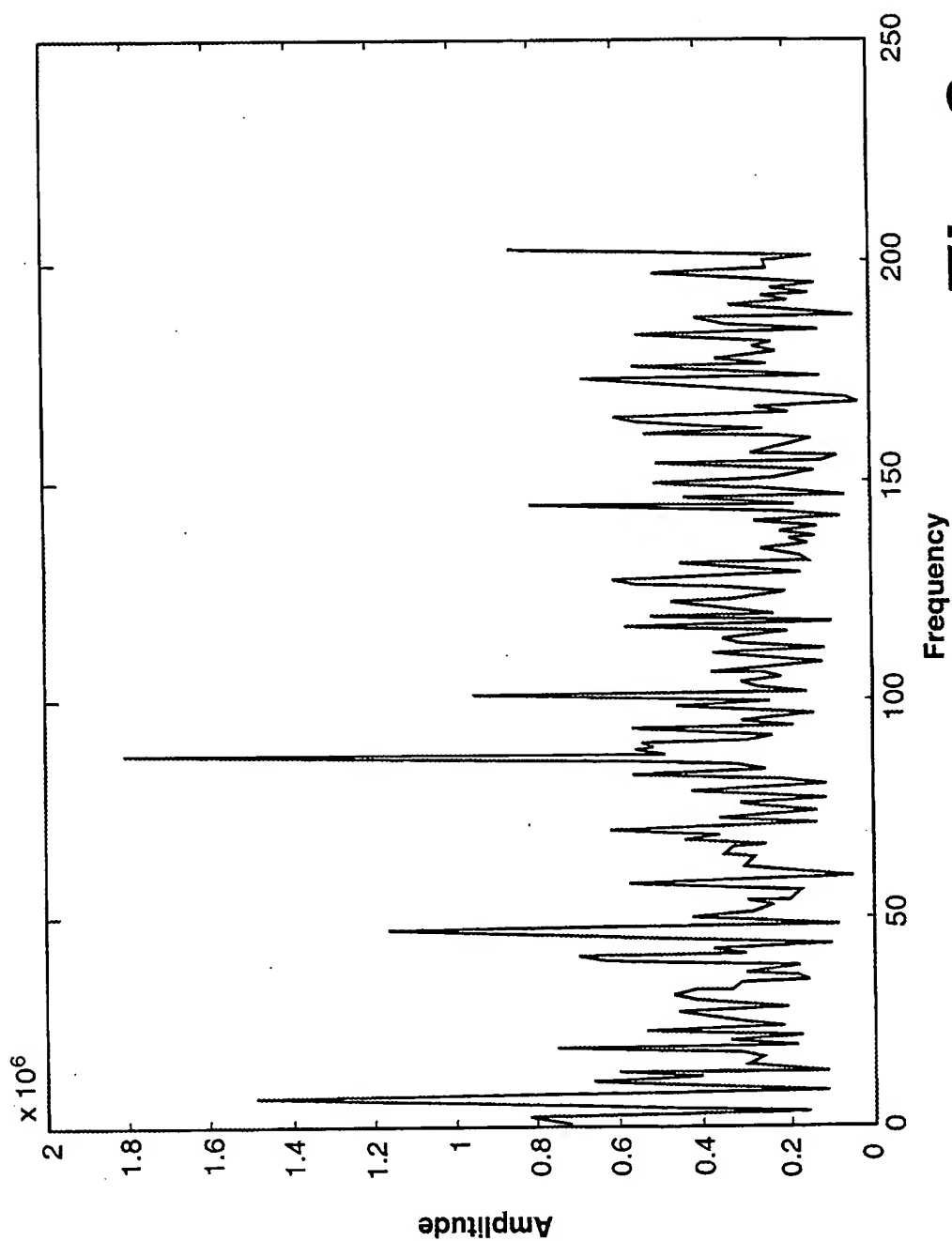


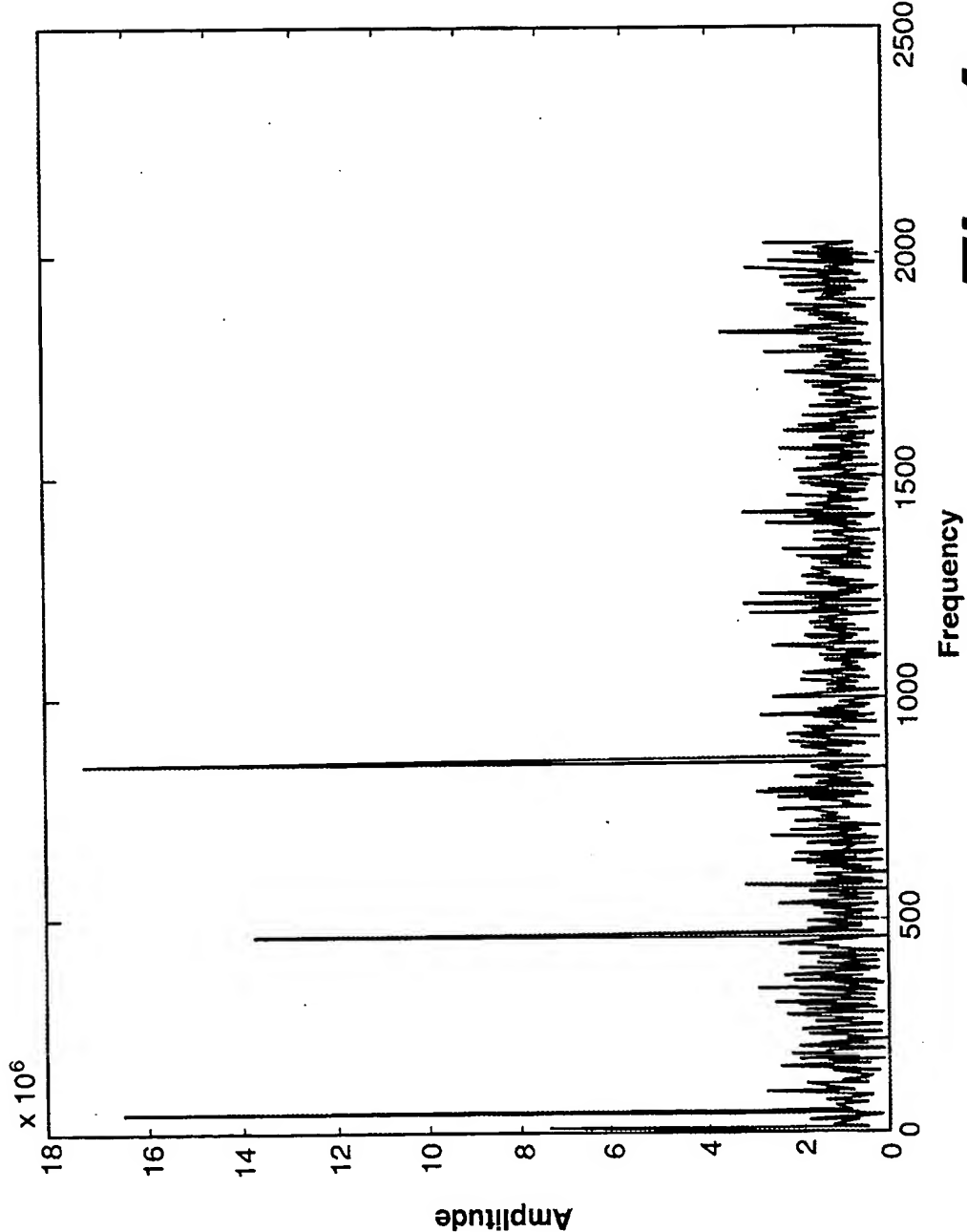
Fig. 2

208210-11325001



**Fig. 3**

208210-19325001



**Fig. 4**